

ABSTRACT

A cyclonic fluid separator for separating condensable, liquid and/or solid components from a fluid mixture includes an upstream fluid inlet section in which the fluid mixture is accelerated to a supersonic velocity to expand and cool the fluid mixture such that one or more condensable fluid components are liquefied and/or solidified; a downstream separation section in which condensables depleted and condensables enriched fluid fractions are separated and fed into separate outlets; and a midstream vortex generation section which includes a plurality of tilted wings of which the wing tips are located at relatively large mutual spacings and at a small spacing from the inner wall of the midstream vortex generation section such that during normal operation of the separator adjacent to the various wing tips widely spaced vortices of swirling fluid are generated in the fluid stream flowing through the housing, which vortices are still separated from each other at the entrance of the downstream separation section.